

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Title: DYNAMIC TRANSMISSION PROTECTION IN THE PRESENCE OF
MULTIPLE MODULATION SCHEMES
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REPLY UNDER 37 CFR 1.116

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This communication is responsive to the Final Office Action dated March 16, 2011, concerning the above-referenced patent application. May 16, 2011 is two months from the mailing date of the office action. Accordingly, this response is timely filed within the Advisory Period.

A Listing of Claims begins on page 2 of this document.

Remarks/Arguments begin on page 13 of this document.

Listing of Claims:

1. (Previously Presented) A method comprising:
determining, at an access point, a power save status of a first device configured to communicate in accordance with a first modulation scheme; and
responsive to a determination that the first device is not in a power save state,
 - (i) enabling transmission protection at the access point; and
 - (ii) transmitting, from the access point, a message requesting that a second device enable transmission protection, wherein the second device and the access point are configured to communicate in accordance with a first and second modulation scheme.
2. (Previously Presented) The method of claim 1, wherein determining the power save status of the first device comprises:
transmitting one of a Request-to-Send frame, a Data frame, and a Null frame to the first device; and
receiving one of an Acknowledgement frame and a Clear-to-Send frame from the first device.
3. (Previously Presented) The method of claim 1, wherein transmitting the message requesting that the second device enable transmission protection comprises broadcasting a management frame.
4. (Previously Presented) The method of claim 3, wherein the management frame is one of:
 - (i) a Beacon frame indicating that protection status is active; and
 - (ii) a Probe-Response frame indicating that protection status is active.
5. (Canceled)
6. (Previously Presented) A method comprising:

receiving, at an access point, a first frame from a first device configured to communicate in accordance with a first modulation scheme; and
in response to receiving the first frame from the first device,
(i) enabling transmission protection at the access point; and
(ii) broadcasting from the access point a message requesting that a second device enable transmission protection, wherein the second device and access point are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

7. (Canceled)

8. (Previously Presented) A method comprising:
transmitting, from an access point, a first message requesting that a first device enable transmission protection and a second message requesting that the first device disable transmission protection, wherein the first message and the second message are continuously transmitted in an alternating pattern, and wherein a time period separates the transmission of the first message and the transmission of the second message; and
in response to receiving a message from a second device at the access point, adjusting the time period separating the transmission of the first message and the second message,

wherein the second device is configured to communicate in accordance with a first modulation scheme, and the first device and access point are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

9. (Previously Presented) The method of claim 8, wherein, if the most recent message sent from the access point to the first device is the second message, adjusting the time period comprises reducing the amount of time until transmission of the first message.

10. (Previously Presented) The method of claim 8, wherein, if the most recent message sent from the access point to the first device is the first message, adjusting the time period comprises increasing the amount of time until transmission of the second message.

11. (Previously Presented) The method of claim 8, wherein the first message is a Beacon frame or a Probe-Response frame.

12. (Previously Presented) The method of claim 8, wherein the message received from the second device is a legacy modulation frame.

13-14. (Canceled)

15. (Previously Presented) The method of claim 8,
wherein the first modulation scheme is based at least in part on one of Barker modulation and Complementary Code Keying modulation; and
wherein the second modulation scheme is based at least in part on Orthogonal Frequency Division Multiplexing modulation.

16. (Previously Presented) A method comprising:
transmitting from an access point a first frame comprising a duration field with a value to a first device via a shared-communications channel in a wireless local area network in accordance with a first modulation scheme, wherein the first device is configured to communicate in accordance with the first modulation scheme and a second modulation scheme; and
receiving at the access point a second frame from a second device via the shared-communications channel in accordance with a second modulation scheme during a time interval defined by the value, wherein the second device is configured to communicate in accordance with the second modulation scheme,
wherein the first frame is undetectable to the second device, and

wherein the first modulation scheme and the second modulation scheme are different from each other.

17. (Previously Presented) The method of claim 16:
wherein the first modulation scheme is based at least in part on Orthogonal Frequency Division Multiplexing modulation; and
wherein the second modulation scheme is based at least in part on one of Barker modulation and Complementary Code Keying modulation.

18. (Previously Presented) The method of claim 16, wherein the transmitting is one of (i) periodic and (ii) sporadic.

19. (Previously Presented) The method of claim 16, wherein the first frame further comprises instructions to refrain from transmitting frames for a time interval.

20. (Previously Presented) An access point comprising:
a memory comprising a computer-readable program; and
a processor operably coupled to the memory and configured to execute the computer-readable program to cause the access point to
determine a power save status of a first device configured to communicate in accordance with a first modulation scheme, and
in response to a determination that the first device is not in a power save state,
(i) enable transmission protection at the access point; and
(ii) transmit, from the access point, a message requesting that a second device enable transmission protection, wherein the second device and the access point are configured to communicate in accordance with a first and second modulation scheme.

21. (Previously Presented) The access point of claim 20, wherein the access point requests transmission protection at the third device by broadcasting a management frame via the shared-communications channel.

22. (Previously Presented) The access point of claim 21, wherein the management frame is one of:

- (i) a Beacon frame indicating that protection status is active; and
- (ii) a Probe-Response frame indicating that protection status is active.

23. (Canceled)

24. (Previously Presented) An access point comprising:
a memory comprising a computer-readable program; and
a processor operably coupled to the memory and configured to execute the computer-readable program to cause the access point to
receive a first frame from a first device configured to communicate in accordance with a first modulation scheme; and
in response to receiving the first frame from the first device,
(i) enable transmission protection at the access point; and
(ii) broadcast a message requesting that a second device enable transmission protection wherein the access point and second device are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

25. (Canceled)

26. (Previously Presented) An access point comprising:
a memory comprising a computer-readable program; and
a processor operable coupled to the memory and configured to execute the computer-readable program to cause the access point to

transmit a first message requesting that a first device enable transmission protection and a second message requesting that the first device disable transmission protection, wherein the first message and the second message are continuously transmitted in an alternating pattern, and wherein a time period separates the transmission of the first message and the transmission of the second message; and

in response to receiving a message from a second device, adjust the time period separating the transmission of the first message and the second message,

wherein the second device is configured to communicate in accordance with a first modulation scheme, and the first device and access point are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

27. (Previously Presented) The access point of claim 26, wherein, if the most recent message sent to the first device is the second message, the access point adjusts the time period by reducing the amount of time until transmission of the first message.

28. (Previously Presented) The access point of claim 26, wherein, if the most recent message sent to the first device is the first message, the access point adjusts the time period by increasing the amount of time until transmission of the second message.

29. (Previously Presented) The access point of claim 26, wherein the first message is a Beacon frame or a Probe-Response frame.

30. (Previously Presented) The access point of claim 26, wherein the message received from the second device is a legacy modulation frame.

31-32. (Canceled)

33. (Previously Presented) The access point of claim 26, wherein the first modulation scheme is based at least in part on one of Barker modulation and Complementary Code Keying modulation; and

wherein the second modulation scheme is based at least in part on Orthogonal Frequency Division Multiplexing modulation.

34. (Previously Presented) An access point comprising:
a memory comprising a computer-readable program; and
a processor operably coupled to the memory and configured to execute the computer-readable program to cause the access point to
transmit a first frame comprising a duration field with a value to a first device via a shared-communications channel in a wireless local area network in accordance with a first modulation scheme, wherein the first device is configured to communicate in accordance with the first modulation scheme and a second modulation scheme; and
receive a second frame from a device via the shared-communications channel in accordance with a second modulation scheme during a time interval defined by the value, wherein the second device is configured to communicate in accordance with the second modulation scheme,
wherein the first frame is undetectable to the second device, and
wherein the first modulation scheme and the second modulation scheme are different from each other.

35. (Previously Presented) The access point of claim 34:
wherein the first modulation scheme is based at least in part on Orthogonal Frequency Division Multiplexing modulation; and
wherein the second modulation scheme is based at least in part on one of Barker modulation and Complementary Code Keying modulation.

36. (Previously Presented) The access point of claim 34, wherein the transmitting is one of (i) periodic and (ii) sporadic.

37. (Previously Presented) The access point of claim 34, wherein the first frame further comprises instructions to refrain from transmitting frames for a time interval.

38. (Previously Presented) An article of manufacture including a non-transitory computer-readable medium having instructions stored thereon that, if executed by an access point, cause the access point to perform operations comprising:

determining a power save status of a first device configured to communicate in accordance with a first modulation scheme, and

in response to a determination that the first device is not in a power save state,

(i) enabling transmission protection at the access point; and

(ii) transmitting, from the access point, a message requesting that a second device enable transmission protection, wherein the second device and access point are configured to communicate in accordance with a first modulation scheme and a second modulation scheme.

39. (Previously Presented) The article of manufacture of claim 38, wherein the access point requests transmission protection at the second device by broadcasting a management frame via the shared-communications channel.

40. (Previously Presented) The article of manufacture of claim 39, wherein the management frame is one of:

(i) a Beacon frame indicating that protection status is active; and

(ii) a Probe-Response frame indicating that protection status is active.

41. (Canceled)

42. (Previously Presented) An article of manufacture including a non-transitory computer-readable medium having instructions stored thereon that, if executed by an access point, cause the access point to perform operations comprising:

receiving a first frame from a first device configured to communicate in accordance with a first modulation scheme; and

in response to receiving the first frame from the first device,

(i) enabling transmission protection at the access point; and

(ii) broadcasting a message requesting that a second device enable transmission protection, wherein the second device and access point are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

43. (Canceled)

44. (Previously Presented) An article of manufacture including a non-transitory computer-readable medium having instructions stored thereon that, if executed by an access point, cause the access point to perform operations comprising:

transmitting a first message requesting that a first device enable transmission protection and a second message requesting that the first device disable transmission protection, wherein the first message and the second message are continuously transmitted in an alternating pattern, and wherein a time period separates the transmission of the first message and the transmission of the second message; and

in response to receiving a message from a second device, adjusting the time period separating the transmission of the first message and the second message,

wherein the second device is configured to communicate in accordance with a first modulation scheme, and the first device and access point are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

45. (Previously Presented) The article of manufacture of claim 44, wherein, if the most recent message sent to the first device is the second message, adjusting the time period includes reducing the amount of time until transmission of the first message.

46. (Previously Presented) The article of manufacture of claim 44, wherein, if the most recent message sent to the first device is the first message, adjusting the time period includes increasing the amount of time until transmission of the second message.

47. (Previously Presented) The article of manufacture of claim 44, wherein the first message is a Beacon frame or a Probe-Response frame.

48. (Previously Presented) The article of manufacture of claim 44, wherein the message received from the second device is a legacy modulation frame.

49. (Canceled)

50. (Previously Presented) An article of manufacture including a non-transitory computer-readable medium having instructions stored thereon that, if executed by a access point, cause the access point to perform operations comprising:

transmitting a first frame comprising a duration field with a value to a first device via a shared-communications channel in a wireless local area network in accordance with a first modulation scheme, wherein the first device is configured to communicate in accordance with the first modulation scheme and the second modulation scheme; and

receiving a second frame from the second device via the shared-communications channel in accordance with a second modulation scheme during a time interval defined by the value, wherein the second device is configured to communicate in accordance with the second modulation scheme,

wherein the first frame is undetectable to the second device, and

wherein the first modulation scheme and the second modulation scheme are different from each other.

51. (Previously Presented) The article of manufacture of claim 50:
wherein the first modulation scheme is based at least in part on Orthogonal Frequency Division Multiplexing modulation; and

wherein the second modulation scheme is based at least in part on one of Barker modulation and Complementary Code Keying modulation.

52. (Previously Presented) The article of manufacture of claim 50, wherein the transmitting is one of (i) periodic and (ii) sporadic.

53. (Previously Presented) The article of manufacture of claim 50, wherein the first frame further comprises instructions to refrain from transmitting frames for a time interval.

REMARKS

Applicant respectfully requests reconsideration of the present application in view of the reasons that follow. Claims 5, 7, 13, 14, 23, 25, 31, 32, 41, 43, and 49 were previously canceled. Claims 1-4, 6, 8-12, 15-22, 24, 26-30, 33-40, 42, 44-48, and 50-53 remain pending in this application.

I. Claim Rejections Under 35 U.S.C. § 103

On page 2 of the Office Action, Claims 1-4, 20-22, 24, and 38-40 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over allegedly Admitted Prior Art in the Background of the present application (U.S. Patent Application Publication No. 2004/0136339) (hereinafter “AAPA”) in view of U.S. Patent No. 7,046,649 to Awater et al. (hereinafter “Awater”) and U.S. Patent No. 5,912,644 to Wang (hereinafter “Wang”). On page 6 of the Office Action, Claims 6, 8-12, 15-19, 26-30, 33-37, 42, 44-48, and 50-53 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over AAPA in view of Awater. Applicant respectfully traverses these rejections.

A. Claims 1-5, 20-23, and 38-40

Independent Claim 1 recites, in part (with emphasis added):

responsive to a determination that the first device is not in a power save state, (i) enabling transmission protection at the access point; and (ii) transmitting, from the access point, a message requesting that a second device enable transmission protection, wherein the second device and the access point are configured to communicate in accordance with a first and second modulation scheme.

Independent claims 20 and 38, though different in scope, include similar claim elements. Applicant respectfully submits that AAPA, Awater, and Wang, alone or in combination, fail to disclose, teach, or suggest such an element.

On page 3 of the Office Action, the Office Action asserted that lines 2-6 of paragraph [0003] and lines 1-5 of paragraph [0015] of AAPA discloses such elements. In addition, page 4 of the Office Action further stated that column 9, lines 8-10 of Wang discloses a “station goes into a power saving mode.”

AAPA describes “transmission protection ... to prevent legacy stations from transmitting while transmissions using the second modulation scheme are in progress.” (§[0014].) Lines 1-6 of paragraph [0003] of AAPA states:

FIG. 1 depicts a schematic diagram of a portion of wireless local area network 100 in the prior art. Local area network 100 comprises stations 101, 102-1, and 102-2. Stations 101, 102-1, and 102-2 use a shared-communications channel to communicate among themselves and only one of the terminals can transmit into the channel at a time.

Paragraph [0015] of AAPA states:

In accordance with transmission protection, an enhanced station that is about to transmit a frame using the second modulation scheme first transmits a short frame using the first modulation scheme. This short frame is detectable by the legacy stations in the area.

As such, the cited portions of AAPA relied on by the Office Action disclose merely a “local area network 100” that uses a “shared communications channel” to provide communications. Paragraph [0015] further states that a station that is about to transmit a frame using a “second modulation scheme” first transmits a short frame using “the first modulation scheme.” However, AAPA fails to provide any indication that such transmissions are “responsive to a determination that the first device is not in a power save state.” Indeed, AAPA fails to provide any indication that these transmissions are prompted by a change in status of another device.

Awater and Wang fail to cure the deficiencies of AAPA. On page 2 of the Office Action, Awater was relied on merely for its alleged disclosure of a “computer-readable medium,

memory, and processor.” Awater fails to provide any disclosure of transmission protection communications that are “responsive to a determination that the first device is not in a power save state,” as claimed.

As discussed above, on page 4 of the Office Action, column 9, lines 8-10 of Wang was relied on for its alleged disclosure of a “station goes into a power saving mode.” Column 9, lines 7-11 of Wang state:

To conserve power, the reference station has the capability to go to a non-active power saving mode at the request of the central station (for example, the system can be shut down during the night) and return to its normal operation sometime later.

As such, Wang discloses merely that a “station” may go into a “power saving mode at the request of [a] central station.” However, merely because a station may enter a “power saving mode at the request of a station” does not disclose, teach, or suggest “enabling transmission protection at the access point” and “transmitting, from the access point, a message requesting that a second device enable transmission protection” in response to a “determination that a first device [different from the first device and the access point] is not in a power save state,” as claimed.

Furthermore, AAPA fails to disclose, teach, or suggest that the “second device” and the “access point” are “configured to communicate in accordance with a first and second modulation scheme.” Such claim elements precludes the interpretation of the legacy station of paragraph [0006] of the present specification as corresponding to either of these devices. This is because paragraph [0006] of the present specification clearly sets forth that the legacy station can only communicate via “a first modulation scheme.” In contrast, independent Claims 1, 20, and 38 recite that the “second device and the access point are ... configured to communicate in accordance with a first and second modulation scheme” (Emphasis supplied.) Because a legacy station does not operate in this manner, Applicant respectfully submits the rejection based on AAPA cannot be reasonably maintained.

Because neither AAPA, Wang, nor Awater, whether considered alone or in combination, discloses, teaches, or suggests at least one element recited in each of independent Claims 1, 20, and 38 (and their associated dependent claims), Applicant respectfully submits that the rejection of these claims under 35 U.S.C. § 103(a) is improper.

B. Claims 6, 7, 24, 25, 42, and 43

On page 6, the Office Action alleged that the combination of AAPA and Awater renders independent Claims 6, 24, and 42 unpatentable. Applicant respectfully disagrees.

Independent Claim 6 recites, in part (with emphasis added):

receiving, at an access point, a first frame from a first device configured to communicate in accordance with a first modulation scheme;

in response to receiving the first frame from the first device, (i) enabling transmission protection at the access point; and (ii) broadcasting from the access point a message requesting that a second device enable transmission protection, wherein the second device and access point are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

Independent Claims 24 and 42, though different in scope, recite similar elements.

For at least the same reasons as set forth above in Section II(A), Applicant respectfully submits that AAPA and Awater, whether considered alone or in combination, fail to disclose, teach, or suggest such elements. In addition, as discussed above, the cited portions of AAPA relied on by the Office Action disclose merely a “local area network 100” that uses a “shared communications channel” to provide communications. Paragraph [0015] further states that a station that is about to transmit a frame using a “second modulation scheme” first transmits a short frame using “the first modulation scheme.” However, AAPA fails to provide any indication that “in response to receiving the first frame from the first device, enabling transmission protection at the access point” and “broadcasting from the access point a message

requesting that a second device enable transmission protection,” as claimed. Thus, Applicant respectfully requests withdrawal of this rejection.

C. Claims 8-11, 26-35, and 44-49

Independent Claim 8 recites, in part (with emphasis added):

the first message and the second message are continuously transmitted in an alternating pattern ...; and

in response to receiving a message from a second device at the access point, adjusting the time period separating the transmission of the first message and the second message, wherein ... second device and access point are configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

Independent Claims 26 and 44, though different in scope, recite similar elements.

On page 8, the Office Action asserted that such elements are disclosed by paragraphs [0003], [0015], and [0017] of AAPA. Applicant respectfully disagrees. As discussed above, the paragraph [0003] discloses that a “local area network 100” uses a “shared communications channel” to provide communications. Paragraph [0015] further states that a station that is about to transmit a frame using a “second modulation scheme” first transmits a short frame using “the first modulation scheme.” Paragraph [0017] discloses a mechanism for “notifying all of the enhanced station in the network when to use and when not the use transmission protection.” However, notifying a device when to use and when not to use transmission protection cannot be reasonably interpreted as adjusting a messaging time period “in response to receiving a message from a second device at the access point, adjusting the time period separating the transmission of the first message and the second message” or as “continuously transmit[ing] messages in an alternating pattern.”

On page 8 of the Office Action, the Examiner appeared to further analogize the “duration field with the length of time for transmission of frames using the second modulation scheme” to

the claimed “adjusting the time period separating the transmission of the first message and the second message.” However, nowhere does AAPA disclose “adjusting” the “duration field” “in response to receiving a message from a second device at the access point.”

Because neither AAPA nor Awater, whether considered alone or in combination, discloses, teaches, or suggests at least one element recited in each of independent Claims 8, 26, and 44 (and their associated dependent claims), Applicant respectfully submits that the rejection of these claims under 35 U.S.C. § 103(a) is improper.

D. Claims 16-19, 34-37, and 50-53

Independent Claim 16 recites, in part (with emphasis added):

transmitting from an access point a first frame comprising a duration field with a value to a first device via a shared-communications channel in a wireless local area network in accordance with a first modulation scheme, wherein the first device is configured to communicate in accordance with the first modulation scheme and a second modulation scheme.

Independent Claims 34 and 50, though different in scope, recite similar elements. Applicant respectfully submits that such elements distinguish the claims from AAPA inasmuch as it particularly describes that the first frame with a duration field is transmitted “to a first device ... configured to communicate in accordance with the first modulation scheme and a second modulation scheme.” In contrast, AAPA describes that the frame is transmitted to the legacy device, which only communicates in accordance with the first modulation scheme:

In accordance with transmission protection, an enhanced station that is about to transmit a frame using the second modulation scheme first transmits a short frame using the first modulation scheme. This short frame is detectable by the legacy stations in the area.

A duration field in the short frame contains a value that indicates how long the legacy terminals should refrain from transmitting, and the field is populated with a duration that is long enough to

cover the length of time for transmissions of frames using the second modulation scheme. The duration information inside the Request-to-Send or Clear-to-Send frame activates a virtual carrier sense mechanism in the legacy stations, which will not transmit, as a result, during the protected, subsequent second transmission.

(AAPA at ¶¶[0015] and [0016]; emphasis added.)

Thus, it would be unreasonable to maintain the rejection based on AAPA in view of the claim amendments, and Applicant therefore respectfully requests withdrawal of this rejection.

Accordingly, Applicant respectfully submits that AAPA, Awater, and Wang, alone or in combination, fail to disclose, teach, or suggest at least one element recited in each of the various independent claims (and their associated dependent claims). Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claims 1-4, 6, 8-12, 15-22, 24, 26-30, 33-40, 42, 44-48, and 50-53 under 35 U.S.C. § 103(a).

* * *

It is submitted that each outstanding objection and rejection to the Application has been overcome, and that the Application is in a condition for allowance. Applicant respectfully requests consideration and allowance of all pending claims.

It should also be noted that although arguments have been presented with respect to certain claims herein, the recited subject matter as well as various other subject matter and/or combinations of subject matter may be patentable for other reasons. Further, the failure to address any statement by the Examiner herein should not be interpreted as acquiescence or agreement with such statement. Applicant expressly reserves the right to set forth additional and/or alternative reasons for patentability and/or allowance with the present Application or in any other future proceeding, and to rebut any statement presented by the Examiner in this or other papers during prosecution of the present Application.

The Examiner is invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present Application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this Application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by the credit card payment instructions in EFS-Web being incorrect or absent, resulting in a rejected or incorrect credit card transaction, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

Date May 16, 2011

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